

REMARKS

Claims 1 and 13 have been amended to recite that (iii) the number of moles of the hydrophilic group Y in 100 g of the fluorine-containing polymer (A) is [not less] greater than 0.14. A number of moles of not less than 0.14 (i.e., 0.14 and more than 0.14) as described at page 14, lines 8-10 of the specification necessarily also describes a range where the number of moles is greater than 0.14 (i.e., more than 0.14). Further, because Applicants also provide additional specific examples at 0.135 moles, 0.17 moles, 0.237 moles, 0.245 moles, 0.251 moles, 0.324 moles (see Table 3 at page 118 of the specification), etc., the limitation of greater than 0.14 meets the written description requirement on authority of MPEP § 2163.05 (III. RANGE LIMITATIONS) citing *In re Wertheim*, 191 USPQ 90 (CCPA 1976).

Support for new claim 22 is found, for example, by reference to PREP. EX. 2 as shown in Table 3 at page 118 of the specification.

Review and reconsideration on the merits are requested.

Claims 1-4, 11-13, 15-18 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,057,080 to Brunsvold et al in view of U.S. Patent 7,214,470 to Araki et al. The grounds for rejection remain the same as set forth in the previous Office Action.

The reason for rejection remains that it would have been obvious to use the fluorinated polymers of Araki et al in the antireflective layer of Brunsvold et al so as to maintain a low refractive index and improve optical characteristics.

The rejection should be withdrawn because (i) it would not have been obvious to substitute Araki et al's fluoroalkyl carboxylate (which is an *optional* component, as discussed below) in Brunsvold et al's system to maintain a low refractive index and improve the optical characteristics of the antireflective film; and (ii) nowhere does Araki et al disclose an

antireflection film comprising a fluorine-containing polymer having a chemical structure within the scope of the present claims, having a hydrophilic group Y, and specifically a carboxyl group, in an amount of 0.26 moles in 100 g of the fluorine-containing polymer. Further, (iii) the rejection should be withdrawn in view of the test data as reported in the Declaration under 37 C.F.R. § 1.132 of Tsuneo Yamashita submitted herewith showing criticality in a number of moles of the hydrophilic group Y in 100 g of the fluorine-containing polymer (A) of greater than 0.14 for achieving the effects of the invention, namely, good solubility and quick dissolution rate in a developing solution.

Applicants explain (i) to (iii) in turn, as follows.

As to (i), the passage at col. 3, lines 45-49 in Brunsvold et al is a clear teaching to the effect that fluorocarbon polymers having a low refractive index cannot be used for replacing the top anti-reflective coating. In response, the Examiner points to the passages at col. 3, lines 50-67 and at col. 4, lines 1-36 where Brunsvold et al is said to teach a multi-component system for an anti-reflective film comprising a fluoroalkyl carboxylate. However, the structural unit derived from a monomer represented by the formula $\text{CH}_2=\text{CFCF}_2\text{-ORf}^6\text{-Z}^2$ identified by the Examiner is an **optional structural unit** (col. 12, line 37-col. 13, line 11), and includes many and various monomers. In order to arrive at the monomer represented by formula (2-1) as claimed in present claim 1, one would have to select COOH for Z_2 in Formula (15) among OH, CH_2OH , COOH, carboxylic acid derivative, SO_3H , sulfonic acid derivative, epoxy or cyano. Even if one were to select COOH, the number of moles of COOH present in the fluorine-containing polymer depends not only on the content of units derived from the monomer having COOH, but also on the structural form of the monomer having COOH.

Because it is an optional component, there is no motivation to substitute Araki et al's fluoroalkyl carboxylate in Brunsvold et al's system; there is nothing to lead one of ordinary skill to select COOH for Z₂ among numerous possibilities; and there is no guidance or teaching in either of Brunsvold et al or Araki et al as to regulation of the COOH content to within the claimed range.

As to (ii), Applicants have studied Araki et al in earnest, and cannot find any description therein which supports the Examiner's contention that Araki et al teaches that the hydrophilic group is present in an amount of 0.26 moles per 100 g of polymer.

As to (iii) above, criticality in setting the lower limit of the number of moles of the hydrophilic group Y in 100 g of the fluorine-containing polymer (A) of greater than 0.14 is demonstrated in the test results presented in the Declaration under 37 C.F.R. § 1.132 of Tsuneo Yamashita submitted herewith. In the comparative testing presented in the Declaration, Mr. Yamashita prepared Experimental Example A wherein the fluorine-containing polymer had a hydrophilic group (COOH) content of 0.147 moles/100 g of polymer just at the lower limit of greater than 0.14 moles, and evaluated the material thus prepared with respect to solubility in water, methanol, ethanol and isopropanol as well as dissolution rate, the results of which are presented in Table A at page 4 of the Declaration. This is the same type of testing that was carried out and reported in the specification. Table A compares the results for Experimental Example A with the polymer of Experimental Example 6 differing in that the hydrophilic group (COOH) content was 0.135 moles/100 g of polymer. Notably, the polymer of Experimental Example 6 was partly insoluble or completely insoluble (x) in each of the solvents, and a dissolution rate in a developing solution could not be measured because the polymer was somewhat insoluble. The test results as presented in the Declaration demonstrate that a number

of moles of the hydrophilic group COOH in 100 g of the fluorine-containing polymer of greater than 0.14 is critical to providing the effects of the invention. None of this is taught, suggested or otherwise recognized by any of Brunsvold et al and Araki et al.

For the above reasons, it is respectfully submitted that the amended claims are patentable over the cited prior art, and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-4, 11-13, 15-18, 21 and 22 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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